News

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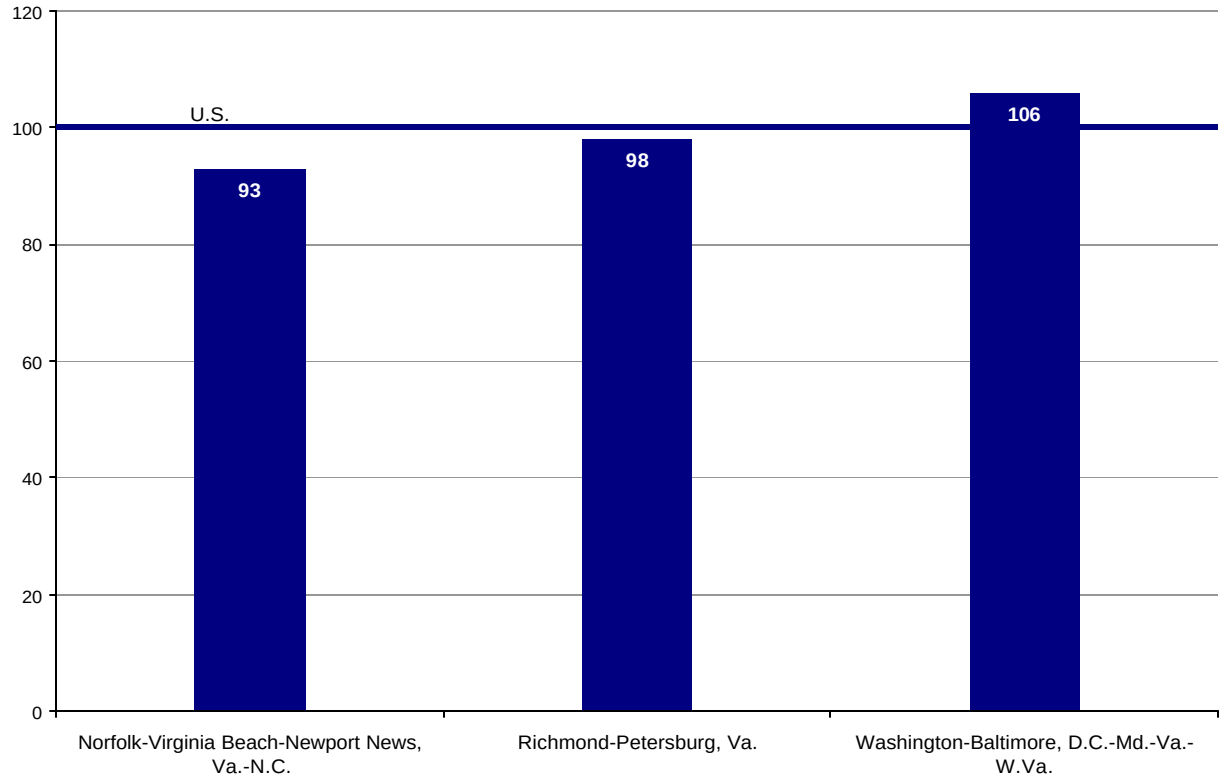
OCCUPATIONAL PAY RELATIVES FOR METROPOLITAN AREAS IN VIRGINIA, 2005

The pay relative in 2005 averaged across all occupations in the Washington-Baltimore, D.C.-Md.-Va.-W.Va. Metropolitan Statistical Area was 106, meaning that pay on average was 6 percent above the national average. In contrast, the pay relative for all occupations in the Richmond-Petersburg, Va. and the Norfolk-Virginia Beach-Newport News, Va.-N.C. Metropolitan Statistical Areas were 98 and 93, meaning pay for workers averaged 2 and 7 percent less than the national average, respectively, according to the U.S. Department of Labor's Bureau of Labor Statistics. Regional Commissioner Sheila Watkins noted that the pay relatives for the three metropolitan areas surveyed in Virginia were statistically significantly different from the national average as a whole with Washington-Baltimore posting pay relatives above the national average, while Richmond-Petersburg and Norfolk-Virginia Beach-Newport News recorded pay relatives less than that for the nation. (See chart A.)

BLS produces occupational pay relatives to facilitate comparisons of occupational pay between metropolitan areas and the United States as a whole. Using data from the National Compensation Survey (NCS), pay relatives—a means of assessing relative pay differences—have been prepared for 2005 for each of the 9 major occupational groups within 78 Metropolitan Statistical Areas, as well as averaged across all occupations for each area.

Chart A. Pay relatives for all occupations in metropolitan areas in Virginia, area-to-nation comparisons, National Compensation Survey, July 2005



Area-to-Nation Comparisons

Workers in the Washington-Baltimore area had significantly higher pay levels than the national average in five of the nine occupational groups (professional and related; service; office and administrative support; installation, maintenance, and repair; and production) for which pay relatives were prepared. (See table A.) In the four remaining groups (management, business, and financial; sales and related; construction and extraction; and transportation and material moving), area workers registered pay relatives similar to those of the nation.

By contrast, workers in the Norfolk-Virginia Beach-Newport News area posted pay relatives significantly less than that for the nation in all nine occupational groups. Workers in the Richmond-Petersburg area were paid significantly lower than the U.S. levels in six occupational groups, while recording significantly higher pay relatives in only the transportation and material moving group. In the remaining two groups (management, business, and financial and installation, maintenance, and repair), Richmond workers registered pay relatives similar to those of the nation.

Table A. Pay relatives for major occupational groups in metropolitan areas in Virginia, area-to-nation comparisons National Compensation Survey, July 2005

Metropolitan Area 1/	All occupations	Management, business, and financial	Professional and related	Service	Sales and related
United States	100	100	100	100	100
Norfolk-Virginia Beach-Newport News, Va.-N.C.	93*	92*	94*	92*	94*
Richmond-Petersburg, Va.	98*	99	97*	98*	97*
Washington-Baltimore, D.C.-Md.-Va.-W.Va.	106*	101	109*	107*	100

Metropolitan Area 1/	Office and administrative support	Construction and extraction	Installation, maintenance, and repair	Production	Transportation and material moving
United States	100	100	100	100	100
Norfolk-Virginia Beach-Newport News, Va.-N.C.	95*	87*	95*	88*	94*
Richmond-Petersburg, Va.	99*	87*	101	96*	106*
Washington-Baltimore, D.C.-Md.-Va.-W.Va.	112*	102	111*	113*	99

* The pay relative for this area is significantly different from the national average of all areas at the 10% level of significance. For additional details, see the Technical Note.

1/ A metropolitan area can be a Metropolitan Statistical Area (MSA) or Consolidated Metropolitan Statistical Area (CMSA) as defined by the Office of Management and Budget, 1994.

Area-to-Area Comparisons

For the first time, similar area-to-area comparisons have been calculated for all 78 areas included in the occupational pay relatives program and are now available on the BLS website at http://www.bls.gov/ncs/ocs/payrel.htm.

Area-to-area pay comparisons are useful in determining the differences in pay levels between two metropolitan areas. This type of comparison requires that the base area be changed from the nation to a specific metropolitan area. For example, when the Norfolk-Virginia Beach-Newport News area was the base area (pay relative = 100), average pay for all occupational groups in the Washington-Baltimore area was 15 percent higher than in Norfolk, and in Richmond-Petersburg, it was 6 percent higher. (See table 1). When the base area was changed to Washington-Baltimore, pay in Norfolk-Virginia Beach-Newport News was 13 percent lower than in Washington-Baltimore and in Richmond-Petersburg, it was 7 percent below.

What is a pay relative?

A pay relative is a calculation of pay—wages, salaries, commissions, and production bonuses—for a given metropolitan area relative to the nation as a whole. The calculation controls for differences among areas in occupational composition, establishment and occupational characteristics, and the fact that data are collected for areas at different times during the year.

Metropolitan areas differ greatly in the types of occupations that are available to the local workforce. For example, in Brownsville, Texas, the ratio of workers in the high-paying management, business, and financial occupational group to the number of workers in all occupations is approximately 5 percent, whereas nationally this ratio is nearly 9 percent.[1] Similarly, the composition of establishment and occupational characteristics varies by area. In addition to these factors, the NCS collects compensation data for metropolitan areas at different times during the year. Payroll reference dates differ between areas which makes direct comparisons between areas difficult.

The pay relative approach controls for these differences to isolate the geographic effect on wage determination. To illustrate the importance of controlling for these effects, consider the following example. The average hourly pay for professional workers in San Francisco is $39.41 and the average hourly pay for professional workers in the entire US is $30.24.[2] A simple pay comparison can be calculated from the ratio of the two average pay levels, multiplied by 100 to express the comparison as a percentage. The pay comparison in the example is calculated as:

$$(\$39.41 \div \$30.24) \times 100 \cong 130$$

However, this comparison does not control for the inter-area difference in occupational composition. Some of the 30 percent pay premium in San Francisco relative to the nation as a whole is due to the higher concentration of highly compensated professional workers in San Francisco. A more accurate estimate of the geographic effect on wage determination in San Francisco can be obtained by taking into account this and other differences. Controlling for the differences in occupational composition, establishment and occupational characteristics, and the payroll reference date in San Francisco relative to the nation as the whole, the pay relative for professional occupations in San Francisco is equal to 117.

Using pay relative data

Because the NCS is a sample survey, pay relatives derived from the NCS will differ to some extent from the true pay relatives that could be calculated only by collecting information on every job in every establishment. For similar reasons, pay relatives derived from the NCS may fluctuate from one year to the next. To assist data users with the use of these data, tests have been conducted to determine whether differences between each pay relative and the pay relative for the nation as a whole are statistically significant (that is, the pay for the given occupation in that area is too different from the national average to be accounted for by the randomness of the survey's sample). Similar tests are conducted for the area-to-area comparisons. In all tables, statistically significant pay relatives are denoted with an asterisk (*). More information on significance testing is available in the Technical Note.

Also because of sample variation from year to year, data users are cautioned about inferring that there have been actual changes in underlying economic conditions from changes in the estimated pay relatives between 2004 and 2005. This caution applies even more strongly to estimates by occupational group.

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[1] Data for this example are based on the May 2005 Occupational Employment and Wage Estimates, http://www.bls.gov/oes/current/oessrcma.htm.

[2] Average pay for professional workers in San Francisco and for the United States are based on wage estimates published in the San Francisco–Oakland–San Jose, CA National Compensation Survey, March 2005 and the National Compensation Survey: Occupational Wages in the United States, June 2005, http://www.bls.gov/ncs/ocs/compub.htm.

Technical Note

Because the NCS is a sample survey, data are subject to sampling error. For the data presented here, sampling error are differences that occur between the pay relatives estimated from the sample and the true pay relatives derived from the population. It is important to assess whether differences between each pay relative and the pay relative for the nation as a whole is likely to be a result of sampling error or of true differences in pay levels. To perform this assessment, a test of statistical significance is conducted.

The test constructs a 90-percent confidence interval that assumes the given area's true pay relative is equal to the national average. The confidence interval is constructed so that there is a 90 percent probability the pay relative calculated from any one sample is contained within the confidence interval. If from a single sample a calculated pay relative falls within the confidence interval, then the pay relative is not statistically significant and the hypothesis that the true pay relative is equal to the national average is accepted. However, if the pay relative falls outside of the constructed confidence interval then the pay relative is statistically significant at the 10-percent level. The hypothesis that the given area's pay relative is equal to the pay relative for the nation is rejected and one can conclude with reasonable confidence that the true pay relative is different from the national average.

In addition to sampling error, pay relatives are subject to a variety of sources that can adversely influence the estimates. The NCS may be unable to obtain information for some establishments; there may be difficulties with survey definitions; respondents may be unable to provide correct information, or mistakes in recording or coding the data may occur. Non-sampling errors of these kinds were not specifically measured. However, they are expected to be minimal due to the extensive training of the field economists who gathered the survey data, computer edits of the data, and detailed data review.

Historical pay relative data are available for 1992-1996, 1998, 2002, and 2004. There are several differences between the recent pay relatives and the pay relatives for earlier years, including different industry and occupation classification systems, varying methodology, and different survey designs. These differences limit comparability. The pay relatives for 2004 and 2005 were calculated using the same industry and occupation classification systems, methodology, and survey design. Nonetheless, comparisons between the estimates for the two years should be made only with a high degree of caution.

Pay relatives were estimated using a multivariate regression technique methodology to control for interarea differences. This technique controls for the following ten characteristics:

- Occupational type
- Industry type
- Work level
- Full-time / part-time status
- Time / incentive status
- Union / nonunion status
- Ownership type
- Profit / non-profit status
- Establishment employment
- Payroll reference date

Even accounting for the characteristics used in the current regression analysis, there is still significant wage variation across the areas. The variation is due to differences in wage determinants that were not included in the model. Examples of these determinants include price levels, environmental amenities such as a pleasant climate, and cultural amenities.

The pay relative regression methodology introduces another type of error. Regression models are subject to specification error. The significance test does not specifically measure specification error. However, care was taken to minimize this form of error by an extensive search across specifications for the model that performs best in terms of predictive accuracy.

For more details, see Maury B. Gittleman, "Pay Relatives for Metropolitan Areas in the U.S." *Monthly Labor Review*, March 2005, pp. 46-53, and Parastou Karen Shahpoori, "Pay Relatives for Major Metropolitan Areas," *Compensation and Working Conditions*, Spring 2003.

Table 1. Pay relatives for major occupational groups in metropolitan areas in Virginia, area-to-area comparisons, National Compensation Survey, 2005

Base Area (Pay Relative = 100)	Metropolitan Area 1/	All occupations	Management, business, and financial	Professional and related	Service	Sales and related	Office and administrative support	Construction and extraction	Installation, maintenance, and repair	Production	Transportation and material moving
Norfolk-Virginia Beach-Newport News, Va.-N.C.	Richmond	106*	108*	103*	106*	103*	104*	99	106*	109*	113*
	Washington	115*	110*	116*	116*	107*	118*	117*	117*	128*	106*
Richmond-Petersburg, Va.	Norfolk	94*	93*	97*	95*	97*	96*	101	94*	92*	89*
	Washington	108*	102*	112*	110*	103*	113*	117*	110*	118*	94*
Washington-Baltimore, D.C.-Md.-Va.-W.Va.	Norfolk	87*	91*	87*	86*	94*	85*	86*	86*	78*	95*
	Richmond	93*	98	89*	91*	97	88*	85*	91*	85*	107*

* The pay relative for this area is significantly different from the average in the metropolitan area at the 10 percent level of significance. For additional details, see the Technical Note at http://www.bls.gov/news.release/ncspay.tn.htm.

1/ A metropolitan area can be a Metropolitan Statistical Area (MSA) or Consolidated Metropolitan Statistical Area (CMSA) as defined by the Office of Management and Budget, 1994.

Chart 1. Pay relatives for all occupations in metropolitan areas in Virginia, area-to-nation comparisons, National Compensation Survey, July 2005